INTRUDER ALERT: ASIAN LONGHORNED TICK

WHAT YOU NEED TO KNOW ABOUT THE INVASIVE TICK *HAEMAPHYSALIS LONGICORNIS*

by James Burtis, Andrea Egizi, James Occi, Emily Mader, Manigandan Lejeune, Kirby Stafford, and Laura Harrington

KEY FACTS:

- Native tick in Eastern Asia[1]
- Invasive tick in Australia and New Zealand[1]
- Discovered in United States in 2017.[2] Now known to inhabit the US since at least 2010.
- First detected in New Jersey. Now found in several eastern US states and Arkansas.
- Three life stages - each seek a host, feed, and drop off.
- Broad host range. Prefers cattle, sheep and horses.
- Considerable biting nuisance causing damage and irritation to livestock, humans, companion animals, and wildlife.[3]

H. longicornis adult (left), nymph (center), and larva (right). (*Photo credit: Manigandan Lejeune, Cornell Animal Health Diagnostic Center*)

OTHER NAMES: Cattle tick (New Zealand); Bush tick (Australia)

HABITAT: Meadows and grassy areas near forests

HOSTS: Mammals and birds

BITES HUMANS: Yes

VETERINARY IMPORTANCE: Confirmed transmitter of bovine theileriosis and parasites that cause babesiosis infection in animals.[3,4] Bovine theileriosis can reduce dairy production on cattle farms and occasionally kill calves. The ticks themselves can also cause anemia in sheep and cattle when densities are high.[3]

MEDICAL IMPORTANCE: In Asia, field-collected Asian longhorned ticks can harbor pathogens that are also present, or closely related to those found in the US. These include *Anaplasma phagocytophilum*, *Ehrlichia chaffeensis*[5], *Babesia* species, and Powassan virus[6]. **The capacity of this tick to act as a vector for these pathogens has not been studied**. This species is also considered a possible vector for Severe Fever with Thrombocytopenia Syndrome Virus (SFTSV) in China[3], an emerging infectious disease with a reported human mortality rate of up to 12.0%.[7]

NOTABLE INFORMATION: Invasive populations of this species are capable of reproducing without fertilization (i.e., do not require males). This biological feature may be what allows them to spread rapidly and reach high abundance. Males are generally uncommon in invasive populations.

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POTENTIAL FOR SPREAD IN THE US:

- **It is possible the Asian longhorned tick is more widespread than currently known**

H. longicornis was first identified in the US in Hunterdon County, New Jersey, on November 9, 2017.[2] The ticks successfully overwintered[8], implying the potential for populations to establish regionally. This species has now been reported in numerous locations in New Jersey outside of Hunterdon County, and in other states, with reported sightings in Virginia, West Virginia, and Arkansas. After reviewing archived samples, there is evidence of species presence several years prior to the 2017 identification.

Female longhorned tick on a leaf. (*Photo credit: James L. Occi, Rutgers University*)

- **Ability of Asian longhorned tick to feed on wildlife with large home ranges (e.g., deer) increases the potential for it to spread**

In its native range, the Asian longhorned tick is known to feed on a wide variety of vertebrate hosts[1,] and invasive populations exhibit similarly broad feeding habits.[9] In the US, this tick has been observed feeding on sheep, goats, horses, and cattle. It has been collected from wildlife including raccoon, opossum, and deer.

- **Given their cold tolerance, Asian longhorned ticks could potentially expand northward, in addition to the risk of spread southward and westward in the US**

In its native range, this species survives in relatively cold climates, generally overwintering as nymphs or adults.[3] Individuals have been reported as far north as Primorsky Krai, Russia[10], a region with a similar climate to the northeastern US. Furthermore, both adults and nymphs collected in China can survive at temperatures below -10 ºC - evidence that they are well-adapted for cold winters.[11] The effect of cold on invasive populations in Australia and New Zealand is unclear due to relatively warm regional climates. There is a need for further evaluation regarding the thermal tolerances of the invasive population in the US. Genetic studies to determine the most likely source of this introduction may help shed light on the climatic range of the invasive US population.

FOR ENTOMOLOGISTS & PUBLIC HEALTH PROFESSIONALS:

We encourage public health professionals, veterinary entomologists, and other trained professionals throughout the northeastern US to begin monitoring for this invasive tick species, as well as examine historical collections of *Haemaphysalis* species, as the Asian longhorned tick may have been present in the US for some time.

Haemaphysalis ticks are small, inornate ticks with eyes absent, festoons present, and with the second segment of the palpi extending laterally beyond the rectangular basis capitulum. Two species of *Haemaphysalis* ticks are native to the US:

- Rabbit tick, *H. leporispalustris*
- Bird tick, *H. chordeilis*

Both native *Haemaphysalis* ticks are broadly distributed across the country. A third species native to Central and South America, *H. juxtakochi*, is also occasionally found in the US, likely transported on migratory birds.[12,13]

Closeup of *H. longicornis* adult female mouth parts. (*Photo credit: Andrea Egizi, Monmouth County Tick-borne Disease Laboratory*)

Many of the characters used to distinguish members of the genus *Haemaphysalis* are subjective (relative lengths and shapes), particularly for the immature stages. This makes these ticks difficult to recognize without firsthand experience or access to a reference collection. As a result, DNA barcode identification has been successfully used to identify ticks in this genus.[2]

For those with extensive experience identifying ticks, key features to differentiate adult female *H. longicornis* from native congeners can be found at neregionalvectorcenter.com/asian-longhorned-tick.

If you believe that you have collected a Asian longhorned tick, please preserve the specimen in ethanol or rubbing alcohol (70% or greater is best).

Researchers and extension specialists may send the specimen for DNA barcoding to Dina Fonseca at the Rutgers University Center for Vector Biology (180 Jones Ave., New Brunswick, NJ 08901), or to the National Veterinary Services Laboratory (USDA-APHIS) for morphological identification using Parasite Submission form 5-38.

Members of the public are encouraged to send specimens to one of the tick identification services listed at www.neregionalvectorcenter.com/ticks.

FOR MORE INFORMATION:

- Review of the biology and ecology of *Haemaphysalis longicornis* Neumann, 1901: Dina Fonseca, Andrea Egizi, James Occi, Rutgers University
- *Haemaphysalis longicornis* Detected in the United States: Jonathan Sleeman, USGS
- Exotic ticks in New Jersey: What are the concerns?: Dina Fonseca, Rutgers University
- Self-cloning Asian tick causing worry in New Jersey: Alvaro Toledo, Rutgers University

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